

# DEMIURGUS

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# What is Demiurgus?

*Demiurge* (or *Demiurgus* to St. Augustine and the Latins) originally comes from the Platonic dialogue, *Timaeus*. In this dialogue, Plato describes the *Demiurgus*, the divine power which produced the harmony of the world out of the discord of chaos. The description of the *Demiurgus* and his work of fashioning given in this dialogue suggest both the possibility of some knowledge of God apart from special revelation and the limits of that knowledge. This obscured reflection is suggestive of the relation between human wisdom and the wisdom of God. Taken positively, however, the name signifies that passionate desire to create something good; or, to speak in terms of Plato's *Symposium*, that thirst to beget beauty which is the essential craving of every fallen creature for the brilliance from which he came and for which he clumsily strives.

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## Call For Articles

The editors of *Demiurgus* hereby request articles, replies to articles, and letters to the editor for the next edition. There will be a meeting to discuss upcoming issues early next semester.

Cover Illustration: Raphael, *Parnassus*, fresco, Vatican, Rome, c. 1511. *Parnassus*, with the seated Apollo in the centre surrounded by the Muses and the greatest poets of the ancient world, depicts Poetry and stands between Raphael's depictions of *The School of Athens* and *The Disputation over the Sacrament* in the Vatican's Stanza della Segnatura.



# Table of Contents

## The Destruction of Mount Parnassus, Or Why Artifacts Are Ugly

Roy Axel Coats ..... 4

## Ancient of Days

Monica Murphy ..... 8

## The Ninth Sense of In?

Joel Feil ..... 9

## Peace, Order, and Unity

Thomas Waldstein ..... 11

## Snowfall

Veronica Ferri ..... 14

## In Defense of Motion:

### Aristotle, Zeno, and Continuity

Caleb Cohoe ..... 15



# The Destruction of Mount Parnassus, Or Why Artifacts Are Ugly

Roy Axel Coats

A revolution has occurred that has desecrated the beautiful mount of Parnassus. The canon that ordered that happy commonwealth of art has been overthrown. Instead the citizens strive only to partake in cheap sensuality without thought of the consequences. The common good of that community of arts has been destroyed; the unifying end of the elements has been destroyed. What is this revolution? It is the revolt of the arts against their laws. It is the anarchist revolt of the material members of the artifacts against the formal unifying principles of the artifacts. Its effect, whether intended or not, is the loss of the holistic teleology of art which the hierarchical order provided. It results in the ugly.

Art is properly divided into two aspects, the formal and the material. Together they form the composite whole of art. There is no real art, and thus no artifact, if both aspects are not combined. Art, like nature, has a composite existence. Yet the composite existence is not intrinsic to the artifact, but rather extrinsic.

The formal aspect of art refers to the ordering of the whole artifact. Vitruvius uses the Latin term *ordo* or the Greek term *taxis* to describe this aspect.<sup>1</sup> The Latin word was originally used for the warp of the loom.<sup>2</sup> The *ordo* provided the framework around which the decorative, visible woof was woven. Generally, it is the orderly sequence of elements. It is also the principle of unity of the artifact insofar as it is an ordering of the whole to an end. The whole is one in virtue of that end.

The material aspect of art refers to the parts that are ordered by the formal aspect. Vitruvius calls these parts *membra*.<sup>3</sup> They are the actual visual members of the artifact and receive the form of the ordering. They are the woof that is woven around the framework of the warp. Yet the ordering is not in them as parts but between the parts making it a whole. Thus the formal aspect is extrinsic to them.

The *membra* related by an *ordo* produce the artifact with a distinct design or *dispositio* or *diathesis*.<sup>4</sup> These words literally mean a putting down, a placing, since all the members have been put in their proper place according to the *ordo*.

There can be a hierarchy of these aspects. Every *membrum* on one level can be a composite of other *membra* on a lower level. For example, the entablature is a *membrum* of the whole Doric temple, yet it itself

consists of the *membra* of the architrave, frieze, and cornice. These, in turn, are smaller composites. Yet, unlike in nature, there are smallest parts which cannot be divided into smaller members. These are the *infima membra*. For example, these are the small blocks used as dentals or in music the individual notes. Both are by nature continuous and thus divisible. Yet as artifacts they are discrete and indivisible. Thus, though nature might be continuous, artifacts are always atomic. Man is unable to use the continuous divisibility of nature and thus works with the discrete. In the opposite direction of the hierarchy, there is also a limit to how high the levels of ordering can go. This is because every artifact is at some level determined by its natural circumstances. For example, the highest level of spatial ordering is that of the city. Beyond the city almost everything is determined by nature itself. We see this *a fortiori* since most of the principles of urban planning are already determined by natural factors.<sup>5</sup> Thus there must be a first *ordo* that is ordering the subordinate orders. This ordering itself will follow nature. Thus there is a hierarchy of *membra* that is ordered as a whole by a single transcendent *ordo*, which is not itself any of the members.

This discussion of art has been carried on without mentioning another element of the fine arts, *eurythmia*, or shapeliness.<sup>6</sup> Shapeliness is a further actuality according to which the composite is beautiful. One can have a design without having beauty. Yet there is no shapeliness without a design, since shapeliness consists in well ordered members. Along with shapeliness, certain other qualifications are made on the ordering by correctness or decorum according to the natural environment, the cultural traditions, and the intended function of the artifact.<sup>7</sup> This paper will focus on the loss of design, assuming that this loss entails a loss of shapeliness.

There are only three arts that exist: the spatial art, the temporal art, and the lingual art.<sup>8</sup> These must be seen as composite wholes. The spatial art consists in ordering space to an end, the temporal art in ordering time to an end, and the lingual art in ordering language to an end. When the art is divided according to the means a division is made only according to the material aspect of art. The formal aspect remains entire. Since the formal aspect is necessary for there to be an art, the art itself remains one. Of these three



arts this paper shall focus on the two that produce immediately sensible artifacts, namely the spatial art and the temporal art.<sup>9</sup> The fact that these are properly the only two immediately sensible fine arts can be seen by an analysis of the senses themselves.

The spatial art is sensed primarily by sight and thus is visible while the temporal art is primarily sensed by hearing and thus is audible. These two senses alone are most proper to the fine arts. The importance of hearing and seeing is seen by an analysis of the five senses. Since fine art has a communal aspect, it must be able to be enjoyed by many. Thus it must be able to be sensed properly by many at a time, a quality which only the senses of sight and hearing possess. Touch and taste demand that you touch the object in order to sense it. Smell demands that you are relatively close. Further, all three senses are subject to variations between persons due to adaptability. Smell is the most adaptable sense; the most pungent odours cease to be noticed after a while. Touch and taste are also prone to adaptation. Lastly, all three senses are easily disturbed through interference by the fleshly aspect of the organ. For example, a cold hand will not sense as well as a warm hand.

In contradistinction to these senses, hearing and vision are able to sense distant things. They are also less likely to adapt to their proper sensible. Hearing can adapt to a continuous sound, but, unlike smell, one can choose to notice the sound again. Further, they are less affected by the fleshly aspect of their sense organs. Only extreme sounds or extreme lights can cause the organ to fail. Therefore, there are two senses proper to the fine arts. Thus the two arts ordered to be perceived by these senses are properly the two fine arts.

In the spatial arts architecture has the office of ordering according to the transcendent ordo. It is the *ars gubernatoria*. Classically, architecture was concerned with painting and sculpture as much as dentils and capitals. Thus all spatial arts were part of architecture. Any division of the spatial art was originally only made according to the different media or the use of the media. Originally, they all combined together to form an integral whole. As the Architect shows in his analysis of the different orders, given one measure, the whole order is determined in all its complexity. There is a hierarchy of parts, whether actually movable or not, that all fit together according to a rule. To move or displace one part is to do violence to the whole. Thus many details are immovable, such as large statuary or frescoes, in order to be more connected with the building. Further, architecture also determines the location and situation of buildings. Thus, the proper ordering by architecture looks at a painting as a unit and determines its place on a wall, the wall in the room, the room in the building, the

building in the city, and the city in relation to the whole cosmos.

The special hierarchy in music is similar, yet due to the temporal unity of any performance of music it has not been divided according to the material aspect as architecture has. Tonal music uses the natural order of the overtone series as a canon to construct hierarchically ordered keys and chords. This hierarchy can be extended further into the orders of keys and meter. Thus there is a hierarchical ordering that combines the parts into a whole. Every unit of time, every note, stands in relation to every other in the whole ensemble and even in relation to the motion of the cosmos.

Thus, all the artifacts are unified by the general hierarchical order of a single governing art, whether architecture or music. This art combines diverse elements together into one end by creating a hierarchy of ends. Thus it imitates the hierarchy of ends as Aristotle describes it at the beginning of the *Nichomachean Ethics*.<sup>10</sup> The highest end orders all the inferior ones.

The problem in the arts is that the ordo and the membra have been cleaved from each other, and a transcendent ordering of the parts has been rejected. In its place the arts have been divided so that the higher level members, those furthest from the indivisible members, become the framework in which the lower membra are placed. The lower arts desire to focus more attention on the individual membra, and not on the organic whole of the artifact. The higher level arts provided the frame and context for the lower level arts. These lower level arts accentuated the higher level arts through ornamentation. Yet without a transcendent ordering keeping all the levels in a united hierarchy, the different levels start to operate independently of each other. Thus, both higher and lower levels come to follow an ordo of their own completely independent of the other. The organic unity between all the levels of the hierarchy of membra has been lost.

The dissolution of the ordo from the membra has caused perversions that have ravaged the arts. As in the city where the constitution and the monarchy have been overthrown the citizens rise up to usurp the authority of the aristocracy as well; so too the lower arts arise to minimize the influence of the higher level arts. There are two general perversions that correspond to the two classes, the frame and the details.

The first perversion is the existence of the frame without details. It corresponds to the aristocrats as they exist after the magistracy has been usurped from them. The dentils have been executed and the guttae are ostracized from the mount. Here the use of the frame has been usurped. Instead of providing order for subordinate membra, it is now ordered by



them. It is now designed to be in potency for as many membra as possible. The desire for a lack of distinctive characteristics always expresses itself in a lack of details. The frame becomes an absolute space in which the details can be placed.

The second perversion is the existence of details without a determined frame. Here the details are made without any frame in particular. Rather, they live in a chaotic state. They are all created to stand on their own and not be perceived in relation to any other member. The details become separate monads with no relation to any other detail.

The special perversions of the spatial arts are clearly distinct. Frame and the details divide themselves up into mobile and immobile artifacts. The immobile artifacts are buildings, large statuary, mosaics, and frescoes. The mobile artifacts are paintings, small statuary, figurines, stuffed animals, pillows, fancy clocks, book ends, ugly souvenirs, and all varieties of general clutter.

The first perversion, that of the frame without the details, leads to two results. The negative result is the removal of all large statuary, mosaics, and frescoes, most of the immobile artifacts. They are too determinate to be part of the moldable frame that is desired. Increasingly even the walls are temporary and put on wheels; all buildings are made to look like warehouses with a frame kept only by necessity. They give shape to space for no apparent purpose, or better yet for every possible purpose. An empty building is supposed to be as much like prime matter as possible; what is one day a church can easily be transformed into a small factory. In fact, most of the major buildings built these days are libraries, museums, concert halls, stadiums, and convention centers. They are built only to house other artificial treasures and not to be a treasure on their own. Rather, they are built to conform in shape, color, texture, in all their elements, to whatever treasures they hold.

The second perversion, that of details without frames, leads to a lack of context. Today if one wants to see art, that is, mobile artifacts, one goes to a museum. One enters the bleak unattractive building and is bombarded by a slew of artifacts in hall after hall on seven levels. Curators, a new type of artist, try to give intelligibility to the menagerie of things, but usually only historically or thematically. One has no reason to look at one painting over another nor to focus on anything at all. Rather, one wanders the halls looking only for either the spectacular and vivid or the disturbing. Thus the artists of the modern day strive with their whole being to produce just that. It would be wrong to say that they have failed. Large, elaborate pieces that fill whole rooms with flashing lights and moving parts scream at the viewer to pay attention to them.

Of importance to the decline of the spatial arts is the rise of mass production of spatial artifacts. Here, artifacts, even artifacts of fine art, are made explicitly for mass consumption. Only the consumer determines how that artifact is going to be used. Since the average modern consumer lacks moderation, vast quantities of cheap artifacts are bought and an attempt is made to display them. The result is a cluttered appearance, whether in offices, libraries, or homes. It is now rationalized that a Monet fits in a kitchen as well as a dining room and does not look awful across from a print of Rubens. (In truth, if someone thinks that a Monet fits anywhere they will think that it fits everywhere) Further, these mass produced artifacts are made for a wide variety of circumstances or frames. Thus, not only are the frames without distinct details, but even the lower membra lose details in order to be appealing to the maximum number of consumers. The result is uniform, cluttered blandness.

The special perversions of the temporal arts are harder to see since the artifact always has at least a temporal unity. Thus, there has not been the convenient division between the higher and lower arts. Yet the hierarchical nature of music can still be destroyed. The perversion of the frame without details is seen in the modern emphasis on beat. Beat provides a frame that alone unifies the parts over it. As with architecture, the beat becomes more and more simple, to the point where it becomes merely a banal thudding. Needless to say, thudding is not a proper principle of unity. The perversion of the details without the frame is best seen in extremes. Much modern music, from Wagner to Cage, determinately rejects the use of a hierarchy or order to tie all its notes and chords together. Rather, one ends with composers who only want us to listen to each theme or even each sound in isolation, without any seeking any context at all. Once the hierarchy disappears, with it goes the unity of the work, and all that is left are the members existing as monads.

Mass production has also caused problems with music. The art behind music is not only what is played but also when it is played. Due to developments in technology, music is accessible at any time. Again, this mass production forces the consumer to become an artist and decide when to listen to what. The poor timing of music is also seen in misapplication of music. For example, people crowd to listen to masses in concert halls and symphonies in churches. Equally offensive is the fact that Wagner is played regularly at weddings. Much trust has been placed in the hands of those who have inherited the tradition of music, and they often fail to use it properly.

In the wake of the fall of the *ordo* of art there have arisen some artifacts that have an ordering of sorts, but here the very *ordo* is wretched and twisted. In these arts the *ordo* is ordering the membra to the



absurd. It attacks art at its core, not by denying the formal aspect, but by turning and twisting it to absurd and often commercially lucrative ends. Mercifully, these artifacts are not generally for common use and benefit, but rather for an individual or a corporation. Most examples of postmodern architecture fit in this category. The monarchic ruler of the past has been replaced with a timocratic ruler interested only in profitable amusement. The *ordo ad finem* has been replaced by the *ordo ad absurdum*. As seen in the time of the Roman Empire, architecture ordered to the absurd is a sign of an extremely decadent society given to funding blatantly whimsical artifacts. It is indeed a sad fact that many are happy to be able to act as artists in their residential warehouses so as not to have to live with rooms predetermined to be ugly.

Against the prevailing trends of today a noxious antidote is often tried, sentimental traditionalism. As in a state where men, on seeing the horrors of the present state, turn to the ideals of the previous ages without understanding or caring about the principles on which those ideals were based, so too in the arts many are returning to earlier forms. Yet they imitate the shapes of the past while often losing their essence. They design buildings not according to an *ordo* but according to sentiment. They are not imitating nature but aping past glories. The canon of this sect is tradition without principles. The spawn of this view take the shape of strange mixed progeny such as warehouses fronted by two Doric columns or with stained glass windows.

When the rule of the *ordo* was lost, the hierarchy which united all the citizens of Mount Parnassus in a well-ordered fashion was lost, and art was divided into two insular classes. The lower, ornamental arts became more individualistic. This individualism led to a disregard for any relationship between any of the neighboring members. Since the aristocratic class had been forced to go on permanent holiday, they could do nothing to police or order the mob of members from the lower class. The result has been anarchist chaos. All this results from a loss of confidence in the existence of a transcendent order, in the existence of a canon of the arts.

## Endnotes

<sup>1</sup> Vitruvius, *Ten Books on Architecture*, 1.2.

<sup>2</sup> Thomas Howe, "Commentary," in Vitruvius, *Ten Books on Architecture* (Cambridge: Cambridge University Press, 1999), p.149.

<sup>3</sup> Vitruvius, *Ten Books on Architecture*, 1.2.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid., 1.4-7.

<sup>6</sup> Ibid., 1.2.

<sup>7</sup> Ibid.

<sup>8</sup> For a further discussion on this division see Roy Axel

Coats, "The Division of the Arts," *Demiurgus* iv.1 (All Saints, 2005): 19-21. As discussed in this article there are also arts that combine the elements of these three arts. Thus there would be an *ordo* that would transcend both the spatial and the temporal.

<sup>9</sup> The lingual arts are being set aside for a moment. They are much more durable than the other arts in so far as they take no materials to make and the medium of language demands that strict rules be followed. Since it directly uses our rationality, it cannot act contrary to it without grating and thus unpopular results.

<sup>10</sup> Aristotle, *Nichomachean Ethics*, 1.1-2.



# Ancient of Days

Monica Murphy

I have run and danced upon these fields  
Under a starry summer sky  
And poured my joy and soul's agony  
Forth from these sloping cliffs.  
I moved beneath the shadow of a mountain goddess:  
Brooding, vast and pregnant with dark secrets  
Untold, unwhispered since these plains  
Were void and empty of crazed youth,  
Drunk with love and life's fantastic ecstasies.

In those past years, when naught  
But a warm wind, or chilling rains  
Or heavy clouds were all that stood  
Between this goddess and her heaven -  
When the stars wheeled through blackness,  
Watched by none, save this frozen giantess -

In those days, did He who formed her body  
Who smote the ground asunder  
Raised cliffs, and called the sun to frenzied power -  
Did He run and dance and sing  
Upon these fields, crazed with love and life's ecstasies  
In the infant hours of the world?



# The Ninth Sense of In?

Joel Feil

In Chapter Three of Book Four of the *Physics*, Aristotle distinguishes eight senses of in: the part in the whole, the whole in the part, the species in the genus, the genus in the species, the form in the matter, events in the agent, a thing in its end, and containment or in place.<sup>1</sup> The first is the converse of the second, as is the third of the fourth. When one reaches the fifth sense, "form in matter," one expects the next sense to be another converse, namely "matter in form." Instead, Aristotle gives no converse for the fifth sense of in. One may wonder, then, whether or not "matter is in the form" is a sense of "in," and if so, why Aristotle leaves it out of a list that seems to have been intended as exhaustive.<sup>2</sup>

That "matter in the form" is a sense of "in" is clear from common speech. One says, for instance, "the cookie is in the shape of a heart," or "the rope is in a noose," or "the man is in the habit." Common, ordinary usage impels one to conclude that "matter is in the form" is an actual sense of the word in. Nor is Aristotle striving after an esoteric and technical definition of in. Rather, in an inquiry into universal experience such as is made in the *Physics*, what is common must come before what is technical and specialized, as Aristotle himself makes clear from the start.<sup>3</sup>

In order to understand the way in which matter is in form, a distinction must be made concerning form. Form is said both substantially and accidentally. Substantial form stands to prime matter as accidental form stands to the substance, because both matter and substance stand toward form as potency stands toward actuality. Substance and matter, however, are quite different. Substance is that which owes its existence to no other and exists through itself; prime matter, on the other hand, is beingless, without form, and exists only because of form. Substance is in potency toward many accidents. Thus, substance is said to be "in the form" because of its potency toward many accidents. This is clear by analogy to containment: the rope may be in a noose, a knot, or a ball, just as the plate may be in the cabinet, the cupboard, or the icebox. Insofar as the plate is potentially in different containing-places, it is like the substance potentially determined by different accidents.

Prime matter, likewise, is in potency toward many forms. Matter, however, is only separable in the mind, because matter cannot exist without form. Thus, it is more proper, not to mention more

common, for "matter in form" to refer to the substance as determined by an accidental form. The Platonist may speak of the matter participating in the form substantially, but even if one allows this to be a possibility, it is certainly not common speech and thus need not be dealt with here. Thus, in as said of matter in the form most properly refers to substance and accident.

In his *Commentary on Aristotle's Physics*, St. Thomas Aquinas states that all the senses of in are reducible to the last one; namely, containment.<sup>4</sup> The sense of in which we are treating is also reducible to containment, as has been touched on above. A few of the ways in which the prior senses of in are reducible to containment should be explained briefly. In general, the placed is contained in some way by the place. The first sense, then, "part in whole," is easily enough seen to reduce to this, insofar as the part is contained by the whole. St. Thomas claims that "genus in species" is reducible to containment by analogy to the integral whole.<sup>5</sup> While this sense is not particularly relevant to our purposes, the next sense, "species in genus," will be quite useful. Thomas comments here that the genus encompasses more than the species *in potentia*, and for this reason it is reducible to containment, just as the part is contained in the integral whole. Further, form is contained in the potency of matter as species is contained potentially in the genus.

The way in which matter is in the form in the sense of "substance in accident" is quite similar to the way in which species is in the genus. The genus is said to contain more than the species in *ratio*, just as a whole contains more than the parts. The genus, however, stands to the species, in a certain way, as potency stands to act. Substance stands to accident as potency stands to act. A certain act determines the potency of a substance and thus contains it. Thus, insofar as the substance is potentially white or black or gray but actually blue, blue will be said to contain the subject. Again, the man is actually in the habit of drinking a glass of bourbon before bed, and potentially in the habit of being a teetotaler. (Lord, deliver us!)

Prime matter, however, unlike substance, has no existence of its own and only exists in the mind through an analogy. The dependent unintelligible existence of prime matter is, perhaps, the reason Aristotle does not give matter in form as a sense of in. Matter is *per se* unintelligible, and can in no way exist on its own. The opposite is said of the



substantial form: it gives the composite its 'what-it-is-to-be' as well as being what is understood in the mind. Further, when I say substance is determined by one accident, and thus contained, I am speaking of something which is separable, and which, without changing its nature, can change its place. Prime matter, on the other hand, goes from one nature to a wholly different nature. There is no thing, then, that can be considered as being in this and then in that, for prime matter is merely a principle of being. Form is also merely a principle of being. However, it may be said to be in the matter insofar as form exists prior to the matter. In short, matter, being mere potentiality, is not one thing that is now here and there, but rather now this thing, then that. Things do not change substantially by changing place, nor do they become in another by changing substantially.

This discussion also sheds light on the reason for Aristotle's failure to include this sense of in, since the sense of matter and form used is ambiguous. An ambiguity, which, in some small way, I hope to have clarified.

#### Endnotes

<sup>1</sup> Aristotle, *Physics*, 4.3.

<sup>2</sup> Aquinas gives time as a possible ninth sense, only to quickly reject it for the reason that it seems to be reducible to the eighth sense (as place measures mobile being so time measures motion). As a discussion of time is outside the scope of this article, I will not deal with this possible sense here.

<sup>3</sup> Cf. *Ibid.*, 1.1.

<sup>4</sup> Thomas Aquinas, *In Libros Physicorum*, Liber 4, Lectio 4

<sup>5</sup> Totum autem quod est secundum rationem, ad similitudinem huius totius sumitur: unde consequenter dicitur id quod est in ratione alicuius, esse in eo; ut animal in homine. *Ibid.*



# Peace, Order, and Unity

Thomas Waldstein

*The following is taken from Part III of the article Peace Order and Unity: a Reply to Ryan Burke, Part I of which appeared in the Ascension 2005 issue of Demiurgus. Part I contains an exposition of the end of the state and the origin of political authority from the point of view of a Catholic theological anthropology. Part II considers some of the movements in modern history which led to an estrangement from the Catholic position in the modern world. Part III attempts to show some of the connection between the ideas examined in Part II and the form of modern governments. The author first examines how the form of the modern state inclines men away from the proper end of government. This is the section published below. Next he shows how the form of the modern state does not incline men well toward the higher end of the city of God. A fourth part, in which a more useful form of government is proposed; and a fifth, in which considers what Christian men ought to do in the present circumstance, are planned. Due to the length of Parts II and III it was decided to publish only the following section from Part III in this issue of Demiurgus.*

It was said above that the purpose of temporal government is the common good, unity, and peace of a society ordered to the higher good of the city of God. I claim that modern liberal democracy, despite some positive aspects, is a form of government that is not very well suited to attaining this end, and inclines men rather to seek the ends proposed by modern philosophy. It inclines men away from the good of order by its intrinsic instability and egalitarianism, and inclines them toward a false love of liberty. It engenders faction, the opposite of unity. It tends to make men subordinate the common good of the state to private goods, so that the whole people becomes "as a single tyrant."<sup>1</sup> The peace which it does bring about tends toward a kind of "concord in discord" in which autonomous individuals balance their private interests so that each achieves the maximum fulfillment of his individual goods. In short, it is the kind of peace which the enlightenment philosophers wished to see. This kind of government does not tend to dispose men well toward the Heavenly City. It tends to foster the virtues which are least helpful and the vices which are most dangerous to Christian life. It tends to engender a false notion of authority that disposes men away from the true religion towards empty imitations. There are ways in which various modern states try to counter act these tendencies, but they are all, more or less, inadequate.

In modern governments everyone has an equal share in the sovereign acts of the people. Moreover, everyone has an equal opportunity to rise. These facts help to foster the development of the famous democratic love of equality. Now as we have seen in Part I, the very idea of order implies subordination. Thus the very love of equality estranges men from the love of order. "Behold, how good and pleasant it is," says the Psalmist, "when brothers dwell in unity! It is like the precious oil upon the head, running down upon the beard, upon the beard of Aaron, running down on the collar of his robes."<sup>2</sup> The peace of a society is like this precious oil descending from superior to

subordinate. Alexis de Tocqueville says the following of aristocratic centuries:

[A]ll citizens are placed at a fixed post, some above the others, it results ... that each of them always perceives higher than himself a man whose protection is necessary to him, and below he finds another whom he can call upon for cooperation.

Men who live in aristocratic centuries are therefore almost always bound in a tight manner to something that is placed outside of them, and they are often disposed to forget themselves.<sup>3</sup>

Contrast this with what he says of democratic societies:

Men who inhabit democratic countries, having neither superiors nor inferiors nor habitual and necessary associates, willingly fall back on themselves and consider themselves in isolation.<sup>4</sup>

The built in egalitarianism of modern states, therefore, inclines men away from the love of order. In a democratic system men can easily change their position. This leads to kind of instability of the society in which everyone is constantly trying to change the position in which he originally found himself. This tends to a further estrangement from the love of order, since the order of the society is always changing. Tocqueville goes on to describe an effect of such elements:

It is therefore never effortless for these men to tear themselves away from their particular affairs to occupy themselves with common affairs; their natural inclination is to abandon the care of the later to the sole visible and permanent representative of collective interests, which is the state.<sup>5</sup>

This leads to a kind of centralization of government, which although it gives the illusion of the unity of



order is really contrary to it. The unity which such a government brings about is an empty and hollow unity. It is not the organic form of the society, but rather an extrinsic and despotic limitation on society. This produces the greatest possible equality among the citizens. The state in such a situation is opposed to the individual citizens as a kind of vast abstract individual. The good of this state is not a common good communicable to many, but rather a kind of abstract private good which is really the good of no one. The deceptive appearance that this gives of being a common good explains the strangely great attraction which such collectivist ideologies as nationalism and communism (which are based on this notion of the good) have had in democratic times.

Now Tocqueville claims that these negative tendencies are not insurmountable, and points out means that can be taken to counteract them.<sup>6</sup> One of these means is necessarily already given in the form of modern democratic states. This is the election of officials by the people. The argument is that when the way to power is through election ambitious men must seek the favor of their countrymen in order to achieve their ambitions. This leads to alliances between men which combat individualism.

The problem with this remedy is that the evils which it leads to are almost as great the ones it is supposed to combat. The first and most obvious one is the evil of faction which it engenders—the evil most contrary to the good of the state. The different parties which the electoral system naturally brings into existence must strive against each other to bring their candidates to power. To do this they portray everything proposed by the opposing party as wrong. The parties which do not rule at any given time declare that the laws and policies of the ruling party are defective and propose new ways of doing everything. This is one of the causes of the mutability of the laws which Tocqueville writes is one of the chief disadvantages of the democratic form of government.<sup>7</sup> The opposition parties generally also attack the persons of the rulers in order to persuade the people to reject them. Thus a certain contempt for rulers is engendered.

The ambitious man in this system is brought to power by persuading one or more factions to support him. Since, however, men are more inclined to pursue their own private good than the common good, it is easier for him to persuade them by assuring them that he will help them achieve their private good. And in fact this is what we see. It is true that since the private good of individuals depends on the common good of the city, politicians persuade by promising common goods, but they subordinate these common goods to the private good of the men whose votes they need. The evidence of this is everywhere in modern states. For example, modern political

discourse is dominated by economic concerns, and the central discussions revolve around how the state should be ordered such that everyone achieves the maximum amount of wealth. Thus the common good of the order of the state is subordinated to the material private goods of the individual citizens.<sup>8</sup> Charles De Koninck described such a state well:

A society constituted by people who love their private good above the common good, or who identify the common good with the private good, is a society not of free men, but of tyrants—"and thus the entire people becomes as a single tyrant."<sup>9</sup>

Mr. Burke has suggested that modern countries have a mixed form of government similar to the one described by St. Thomas in the *Summa Theologiae*. The resemblance, however, is deceptive. While St. Thomas proposes a monarchical government limited by aristocracy and democracy, modern governments are polyarchical with aristocratic and monarchical elements. Thus, St. Thomas's arguments against polyarchy, which Mr. Burke accepts, apply to these governments as well. Recall what was stated in Part I: the good of society being a common good, men are ordered to it, as parts to a whole, and the imperfect to the perfect. The whole point of government is to order men to the common good. The electoral system, by its very nature, tends to order the common good to the private good. Therefore, it tends to subvert the end of government.

Admittedly, this problem is greater in parliamentary governments, such as England and Germany, than in governments where the officials are elected for fixed terms of several years duration, such as the United States. This, however, is a matter of degree—not kind.

Another remedy, which Tocqueville mentions, is also built into the form of most modern states: the principle often called "subsidiarity," or, in its democratic form, "federalism." The principle of subsidiarity is that every portion of the state ought to be given a local government to regulate its own affairs. Thus, each village, township, province etc. has its own government to regulate the affairs with which its own affairs. This is a much more promising remedy than election. Indeed, every well ordered state will make use of this principle. The kind of hierarchical structure of different levels of government seems to be one of the chief properties of the peace of a society. The principle of federalism, in those countries where it is used, has had a certain degree of success in remedying some of the evils that flow from equality, especially centralization.

The problem with this remedy is the way in which it is used in democratic societies. It functions there just like the national governments do. In a better political order such a hierarchy of governments



would be an image of God's rule of the world, in which, "he orders the lower things through the higher, and the bodily things through the spiritual."<sup>10</sup> Modern democratic federalism is much more horizontal in character. The lower governments oppose themselves to the higher in a kind of competition. Since they are more successful than the national governments at producing the illusion of self-government, the local governments are also more successful in inclining men toward a false love of liberty—and against a love of submission and subordination for their own sake. They are supposed to make men see their dependence on others and cure them of individualism, but they produce individualism themselves. They tend to give the impression that what is more common is for the sake of what is less common. Tocqueville describes well how this system interests people in the common good:

Only with difficulty does one draw a man out of himself to interest him in the destiny of the whole state, because he understands poorly the influence that the destiny of the state can exert on his lot. But should it be necessary to pass a road through his property he will see at first glance that he has come across relation between this small public affair and his greatest private affairs, and he will discover, without anyone's showing it to him, the tight bond that here unites the particular interest to the general interest.<sup>11</sup>

Men left to themselves are more likely to pursue the private good than the common good, this is why they need rulers to impel them to the common good—to "show" it to them. Instead of doing this, the modern system tends to make men pursue the common good of their own accord, because they see it as subordinate to, or confused with, their private good. The doctrine of "self interest well understood" is the principle most operative in modern politics. It is the gospel of selfishness and tyranny: "let us all be tyrants together, each ordering the common good to his private good, and thus each shall achieve the maximum of private goods." Such a doctrine seems most reasonable to the city of man, which, as Augustine says, is defined by the love of self to the contempt of God.

These difficulties, having to do with the fitness of modern democracies to produce the proper end of government, seem to have a certain weight; however they are perhaps not entirely convincing. For one can object that these difficulties have to do with mostly with tendencies rather than with necessities, and that a great statesman will always be able to properly order men toward the common good, irrespective of the form of government.<sup>12</sup> Further it can be argued

that all government has evil tendencies and that even if modern government tends towards tyranny it is the gentlest kind of tyranny. For, as St. Thomas remarks, the private good of many is closer to the common good than the private good of a few, therefore the kind of government that is ordered to the private good of practically everyone is the least tyrannical.<sup>13</sup> Government is not very important, after all, and even if a gentle tyranny prevents the common good of the city from being well pursued it does not prevent men from seeking the common good of the family, and most importantly that of the city of God. Therefore, it seems to me, the objections that are taken from how well the modern form of government is ordered to the higher end of the city of God are much more forceful, since it is in relation to the final end that all human action must be absolutely judged. Let us now turn to those objections.

### Endnotes

<sup>1</sup> St. Thomas Aquinas, *On Kingship*, 1.1.

<sup>2</sup> Psalm 32.1-2.

<sup>3</sup> Alexis de Tocqueville, *Democracy in America*, (University of Chicago Press, 2000), p. 483.

<sup>4</sup> Ibid. p.643.

<sup>5</sup> Ibid. p.643.

<sup>6</sup> Vide: e.g. Ibid. pp. 486-488.

<sup>7</sup> Vide e.g.: Ibid. pp. 238-239.

<sup>8</sup> I do not wish to claim that this obsession of modern politics with wealth is do only to the form of government—it is also due to a myriad of other causes (some of which should be clear from Part II of this essay)—however, if nothing else, the form of government at least aggravates this problem.

<sup>9</sup> Charles De Koninck, *On the Primacy of the Common Good*, p.25. De Koninck's quotation is from *On Kingship*, I, 1.

<sup>10</sup> St. Thomas Aquinas, *Summa Contra Gentiles*, Book III, Part I, ch. 83.

<sup>11</sup> *Democracy in America*, p.487. Notice, a road is not a common good, but it is ordered to the common good.

<sup>12</sup> Abraham Lincoln and Winston Churchill are often mentioned as examples of this. I do not know enough about these men to know whether it is true or no, but it is at any rate interesting to note that many people see Lincoln as subverting the principles of popular government.

<sup>13</sup> Vide: *De Regno*, ch. 3.



# Snowfall

## Veronica Ferri

I stood amid the drifting hosts  
that fell upon the frozen lawn  
White blanket at my feet did boast  
the handprint of the martyred dawn

The earth beneath the snow was dead  
But in a death much more like sleep  
Then heavenward I turned my head  
and falling snows caused me to weep

My intellect then strained to know  
why fallen souls their shadows throw  
by contrast light upon some face  
that has been kissed by saving grace

And then my heart sang its reply  
and silent reason gave it way  
Although I'd not say it was I  
that made my heart disposed this way

Then faith was like a startling light  
which penetrated mind and heart  
With new eyes I beheld that sight  
and knew Who set the saved apart

Along my course I've often sought  
to teach some soul what grace had taught  
But man can't teach the heart to know  
what God can do with falling snow



# In Defense of Motion: Aristotle, Zeno, and Continuity

Caleb Cohoe

The paradoxes of Zeno of Elea, referred to and discussed by both Plato and Aristotle, are perhaps the most well known and oldest arguments against manyness in the Western tradition. In the sixth book of his *Physics*, Aristotle considers four of these paradoxes regarding motion.<sup>1</sup> In each of these paradoxes, Zeno attempts to draw some contradiction or impossibility out of the nature of motion. Each of his arguments assumes some motion and produces an impossibility from this motion; one is then to infer that the unreality of the impossibility must come from the unreality of motion.

I shall look at Aristotle's statement of and answer to Zeno's first and most famous paradox, based on half-distances, as given in book six and reformulated in book eight of Aristotle's *Physics*. I shall argue that Aristotle shows that the problems of Zeno arise from a misunderstanding of the nature of motion's continuity. Aristotle's understanding of the continuous as that which is undivided in act while being infinitely divisible in potency allows him to answer both formulations of Zeno's paradox,

Aristotle turns to the paradoxes of Zeno in chapter nine of book six after having established in the earlier chapters of book six that magnitude, motion, and time are continuous in the same way, that their continuity implies that they are not composed of indivisibles but are instead always divisible, and that there is not some first part of moving or last part of coming to a stand.<sup>2</sup> These implications of motion's continuity give him the foundation he needs to oppose Zeno's arguments.

The first argument against motion given by Zeno, according to Aristotle, is "about not moving because what is borne must reach the half before the end."<sup>3</sup> From Aristotle's various references to this first problem, Zeno's argument can be stated as follows: let a mobile, D, move from A to B, a finite distance, in some finite time, C. In order to go from A to B, D must first go through half of AB; before going through half, however, it must go through half of the half and so on *ad infinitum*. Thus motion from A to B requires traversing an infinite magnitude, since there are infinite halves to traverse, and this is impossible in the given finite time C, no matter how large it is. There is, therefore, no motion in a finite time.<sup>4</sup>

Although this is the first of Zeno's arguments, Aristotle spends little time countering it. Indeed, in

chapter nine he only makes mention of it in order to dismiss it, noting that the solution to the argument was already made clear in chapter two of book six.<sup>5</sup> There Aristotle argued that in motion the time of the motion and the magnitude over which the mobile moves are divided in the same way.<sup>6</sup> If, then, one divides the magnitude which is to be traversed, the time taken to traverse the magnitude will have to be divided in the same way.<sup>7</sup> There is, moreover, a certain equivocation on infinite:

For both length and time, and generally, every continuous thing, is called infinite in two ways, either according to division or with regard to its extremes. In the case of infinities according to amount, then, touching these cannot happen in a finite time, but touching the infinities according to division can happen: for time is itself infinite in this way.<sup>8</sup>

The time C required for D to move from A to B, will then be divided in the same way as the magnitude AB. Even if one allows them both to be infinitely divided, there will be no incongruity between the time and the magnitude since both will be infinite according to division without being infinite according to amount, since both the magnitude and time have set extremes.

This first paradox, then, seems to present no real difficulty for motion. Aristotle, however, represents the argument in a more challenging form in book eight, bringing out a difficulty which seems to be implied in the notion of infinite divisibility, apart from any relation of time and magnitude.

Aristotle points out that the follower of Zeno need not bring in the notion of a finite time but may instead ask:

Whether one must always go through the half, while these are infinite, and it is impossible to go through the infinite; or, as some ask this same argument in another way, holding it worthy to count, at the same time as the moving, first the half, according to each half coming to be. Whence, if the thing has gone through the whole, it happens that an infinite number has been numbered. This, however, is admittedly impossible.<sup>9</sup>



Motion through any magnitude will require movement through an infinite number of half-distances, but one cannot go through nor number the infinite.

This difficulty brings out an ambiguity in Aristotle's discussion of the continuous in books five and six. There the continuous sometimes seems to be spoken of as if it is divided. For example, Aristotle argues in chapter six of book six that everything which is moving has moved concluding that, "if the nows are infinite, everything which is changing will have changed with respect to infinite things."<sup>10</sup> It is easy, on first reading this, to take it as a statement that any changing in the thing necessitates an infinite number of actual changes. Some commentators have argued from this that Aristotle is really putting forward two different and ultimately contradictory understandings of the continuous.<sup>11</sup> If the account of change and the continuous given in the sixth book leads to an infinite number of actual changes which cannot be traversed through change, Aristotle's first answer would be based on an inconsistent account of motion which cannot deal with the problems of the infinite. Aristotle's answer in book six would then be only a sophist's response to Zeno.

The answer to this difficulty is found in the definition of continuous used in books five and six and the understanding of act and potency which this definition implies. In book five Aristotle describes the continuous as "when, in those which touch, the limit of each comes to be one and the same, and, as the name signifies, are held together. This is not possible if the extremes are two."<sup>12</sup> In saying something is continuous, one is saying not only that the extremes of the parts are touching but that the extremes of the parts are one; that is, that there are no actual parts. There are parts with distinct limits in the coming to be of a continuous thing, but when the continuous has come to be any actual division into parts is negated. Aristotle, in defining the continuous through the union of actually divided contiguous parts, allows one to see the continuous whole through its parts by referring to a preceding condition in which the parts are actually there. One cannot see potential parts and therefore one cannot directly see the nature of the continuous, since the continuous as continuous does not have actual parts. It can be understood through what is actual, however, by imagining its parts as being actual and contiguous and then negating their difference. The continuous, like matter, is not understood directly.<sup>13</sup>

This understanding of the continuous, which takes into account the distinction between actual and potential division, is, however, the very definition of the continuous Aristotle uses in book six. He begins the book with a restatement of the definitions of continuous, contiguous, and successive given in book

five and argues from these definitions that the continuous cannot be divided into indivisibles and thus must be divisible into things which are always divisible.<sup>14</sup> He then uses the infinite divisibility which follows from the continuous nature of magnitude, motion, and time to establish that there is no first part of moving or last part of coming to a stand, as noted above.<sup>15</sup> If all the arguments in book six depend on what is continuous being the undivided, one would be surprised if Aristotle argues to an infinite number of actual divisions in the continuous.

Given this, the nature of the argument in chapter six which was taken to conclude to an infinite number of changes can be re-examined. Aristotle states that this argument is to show that everything which is moving has moved before. He shows this by three arguments, one from motion and two from time. The first argument involves a mobile moving through some magnitude in a given time. If a second mobile starts at the same time and moves at the same speed but moves for half the time, it will have moved through the same magnitude as the first mobile at that point, since what moves at the same speed over the same time traverses the same magnitude. The having moved of the first mobile is then seen through a motion which is actually divided and comes to an end while the first mobile is moving. The having moved of the continuous is seen through an actual division in something other than the motion. Similarly, the two arguments from time proceed from an actual division of the time to the moving having moved. Thus, whenever the mobile is moving, it is shown to have moved not by an actual division in the motion but by some actual division in time or in the motion of a different mobile. There will actually be an infinite number of changes only if an infinite number of actual divisions can be made.<sup>16</sup>

Aristotle does not explicitly consider whether this infinite can be made actual in chapter six, since the aim of the argument is to show that any moving requires the mobile to have already moved, not to address problems with motion. Aristotle makes further and subtler distinctions when necessary for the argument or when new difficulties arise, but not gratuitously. Aristotle's own characterization of Zeno's first paradox in book eight supports this. After restating Zeno's paradox in its more challenging form, he notes that the answer given before was sufficient though not complete; it answered Zeno's argument even if it was not fully adequate to the truth of the matter.<sup>17</sup> Both motion and time are infinitely divisible in potency and this is sufficient to show that finite motion must occur in finite time, infinite in infinite.<sup>18</sup> According to Aristotle, the answer given in book eight reveals the truth of things more deeply, not by negating the earlier argument, but rather by making the further distinctions necessary to address the more



formidable phrasing of Zeno's paradox. A similar case is given in the very same chapter in Aristotle's discussion of infinite rectilinear motion. Aristotle had rejected the possibility of infinite rectilinear motion at the end of book six as implying an infinite magnitude between the extremes, but when a new sense of infinite rectilinear motion is proposed, a continuous and everlasting back and forth motion between extremes a finite distance apart, a more refined answer is needed. Thus, Aristotle gives new arguments against this new possibility in chapter eight, while still agreeing with his earlier statements on the question.<sup>19</sup>

With these qualifications made, Aristotle's answer to the second formulation of Zeno's paradox can be considered. Aristotle concedes that magnitude, motion, and time are continuous and, as such, infinitely divisible in potency. He argues, however, that insofar as they are actually divided they are no longer continuous. The continuous is infinitely divisible but it is not composed of infinite actual parts. Therefore, the thing which moves goes through infinite things accidentally, but not simply. The impossibility of Zeno's argument came, however, from going through or numbering an actual infinite, not from going through the infinitely divisible; thus there is no impossibility in motion.<sup>20</sup>

In order to understand Aristotle's answer to Zeno and, in particular, his distinction between potential and actual division, it will be helpful to look to Aristotle's use of the distinction between actually and potentially divided motions earlier in the chapter. There Aristotle distinguishes between actual and potential division in order to show that motion in a straight line back and forth between two extremes cannot be continuous. If one concedes that a mobile moving back and forth between extremes could turn around instantaneously, it would seem that this back and forth motion could be one and continuous, and thus there would be a rectilinear motion which could be eternal and infinite.

It is precisely this position, that the mobile does not take time to turn around, which Aristotle sees as impossible and it is in opposition to this that he lays out the principles he uses in defending motion from Zeno's second attack.<sup>21</sup> Aristotle holds that one knows that a mobile will take time to turn around not only from sense experience but also from argument; an instantaneous change from one motion to the other is impossible:<sup>22</sup>

The principle is this: for there being three things, the beginning, the middle, and the end, the middle is both in relation to each, and is one in number, but two in account. Moreover, what is in potency and what is in act are different.<sup>23</sup>

Aristotle first applies these principles to the division of a motion from one point on a straight line to another:

Whence, any point of the ones within the ends of the straight line is a middle in potency, but not in act, unless the mobile divides in this point and, coming to a stand, again begins to move. Thus, however, the middle does come to be a beginning and an end, a beginning of the later motion, and end of the first motion.<sup>24</sup>

If mobile A is moving from A to C, and this motion is actually divided at B, the mobile must rest at B. For the division of motion to be actual, B must be a middle between A and C; it must be the end of the motion from A to B and the beginning of the motion from B to C. This, however, requires that the motion not be continuous. The mobile A which is continuously moving to C cannot come to be in B and come to be away from B, as it would if B were a terminus, but can only be at B in the now. For if it comes to be in B, it cannot at the same now come to be away from B, for it cannot be at and not at B at the same now. Between any two nows, however, there is time; thus the mobile must rest at B and thus the movement of A will not be continuous.<sup>25</sup>

Aristotle goes on to apply this reasoning to the case of the mobile turning back in a straight line. The end of the straight line will serve as a middle in act, not only in potency, since it is the end of its motion from A to B and beginning of its motion from B to A. When it comes to B, its motion from A will have ended and its motion to B will begin. Consequently, the mobile will have to be at B for some time since, again, it cannot come to be at B and come to be away from B at the same time.<sup>26</sup> Since the division of motion is actual and not potential once cannot say that the mobile is at B "in the cut, though it did not come to be [there] nor come to be away from [there]. For it is necessary to come to an end in act, not in potency."<sup>27</sup> B, as the end and beginning of motions, is a point which the mobile must come to be in and come to be away from, not simply a point which the mobile is at in a now. Aristotle is not then assuming, as some have suggested, that there is some first instant of the second motion.<sup>28</sup> Indeed, he argues decisively against there being any first of motion in book six.<sup>29</sup> Instead, he simply argues that the now at which the mobile comes to be at B cannot be the same as the now at which it comes to be away from B, and thus the mobile must rest at B.

This argument, then, shows in the particular case of motion the difference between the divisible and the divided. Motion as continuous is able to be divided at any point; insofar as it is actually divided, however, it will not be continuous. The particular case



manifests Aristotle's general claim.<sup>30</sup> The continuous is composed from parts only in a potential manner.

Aristotle's understanding of the continuous and of motion as continuous leads to motion being infinitely divisible while being actually undivided. The potential nature of this infinity allows him to answer Zeno's paradox by pointing out that Zeno's argument requires that the infinite in the continuous be actual, which is impossible for the continuous as such. If Aristotle is correct in his understanding of the continuous and of the nature of motion, motion is infinitely divisible but cannot be infinitely divided. The modern understanding of the continuous, in contrast, tends to define the continuous as comprised of an infinite number of actual divisions.<sup>31</sup> This notion of continuity solves Zeno's paradox by embracing it. It sees the continuous as being actually composed of infinite parts. Motion is composed of an infinite number of discontinuous moves which are actually traversed, although not by motion. Aristotle, in contrast, starts with the continuous as undivided and proceeds from this to its infinite divisibility. Understanding the continuous as undivided allows Aristotle to specify a sense of the infinite which will avoid Zeno's paradox without limiting divisibility.

#### Endnotes

<sup>1</sup> Aristotle *Physics* 6.9, 239b5-240b8.

<sup>2</sup> See, specifically, Aristotle *Physics* 6.1, 231b19-21, 232a18-23; 6.1, 231a21-231b18; 6.5, 236a9-37, 6.6, 236b33-237b9; 6.8, 238b23-239a11.

<sup>3</sup> Ibid., 6.9, 239b11-12. All quotations are taken from the Coughlin translation.

<sup>4</sup> This formulation of the argument is based on Aristotle's statements concerning it in *Physics* 6.2, 233a12-21, 6.9, 239b10-14, and 8.8, 263a12-a22.

<sup>5</sup> Ibid., 6.9, 239b11-13.

<sup>6</sup> Ibid., 6.2, 233a12-21.

<sup>7</sup> Ibid., 6.2, 233a17-a30.

<sup>8</sup> Ibid., 233a25-a28.

<sup>9</sup> Ibid., 8.8, 263a5-a11.

<sup>10</sup> Ibid., 236b33-237a18.

<sup>11</sup> See, for instance, Sarah Waterlow, *Nature, Change, and Agency in Aristotle's Physics*, (Oxford: Clarendon, 1982) who argues that Books Six offer an analysis of process or change by means of temporal structure (133) distinguishing process from non-processive actuality on the basis of the infinite series involved in a process (135) in a way opposed to the understanding of process in books III and VIII (144-146)

<sup>12</sup> Ibid., 227a13-14.

<sup>13</sup> The continuous may tend to come from that which is in contact, as Aristotle notes (227a14-17), but its definition can be understood not only from seeing the continuous come from the contiguous (as in the case of growing together) but also through

making an imaginary division into actual parts and then negating this division; this allows the mind to understand the continuous and potentially divided through actual division.

<sup>14</sup> Ibid., 6.1, 231a21-231b18,

<sup>15</sup> Ibid., 6.5, 236a9-37, 6.6, 236b33-237b9; 6.8, 238b23-239a11.

<sup>16</sup> Ibid., 6.6, 236b33-237a17.

<sup>17</sup> Ibid., 8.8, 263a12-a22.

<sup>18</sup> Ibid., 6.7, 237b23-238b22.

<sup>19</sup> Ibid., 8.8, 261b32-263a3.

<sup>20</sup> Ibid., 263a23-263b8.

<sup>21</sup> It should be noted that he also offers arguments based on the species of motion (261b32-262a12, 264a8-264b9) Nevertheless, it is his argument about duration that is pertinent to the consideration of division in the continuous.

<sup>22</sup> *Physics*, 8.8, 262a18-19. One could also note that Aristotle does not argue, as one could, that the nature of locomotion, as being caused by some contact, some push or pull, requires a certain compressibility in the mobile and hence a certain time for it to be affected.

<sup>23</sup> Ibid., 262a20-23.

<sup>24</sup> Ibid., 262a23-27.

<sup>25</sup> Ibid., 262a27-262b8.

<sup>26</sup> Ibid., 262b27-29.

<sup>27</sup> Ibid., 262b29-33.

<sup>28</sup> See, for instance, Richard Sorabji, *Time, Creation, and the Continuum: Theories in Antiquity and the Early Middle Ages*, (Ithaca, NY: Cornell University Press, 1983) who states that Aristotle's argument against an infinite number of back and forth motions assumes that there is "a first instant of having left [the point of reversal.]" (Sorabji, 324)

<sup>29</sup> *Physics*, 6.6, 236b33-237b9.

<sup>30</sup> Ibid., 8.8, 263a24-33.

<sup>31</sup> See, for example, Sorabji, 405: "I shall assume that motion is continuous. By this I mean that it involves passing through an infinity of points, between any two of which there are other points, which are also passed through."



